

Refine Search

Search Results -

| Term | Documents |
|---|-----------|
| 324/300 | 628 |
| 324/300S | 0 |
| 324/301 | 309 |
| 324/301S | 0 |
| 324/302 | 47 |
| 324/302S | 0 |
| 324/303 | 608 |
| 324/303S | 0 |
| 324/304 | 183 |
| 324/304S | 0 |
| 324/305 | 27 |
| (L1 AND 324/300- 324.CCLS.).PGPB,USPT,USOC,EPAB,JPAB,DWPI,TDBD. | 22 |

[There are more results than shown above. Click here to view the entire set.](#)

Database: US Pre-Grant Publication Full-Text Database
 US Patents Full-Text Database
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 EPO Abstracts Database
 JPO Abstracts Database
 Derwent World Patents Index
 IBM Technical Disclosure Bulletins

Search:

Search History

DATE: Monday, February 20, 2006 [Printable Copy](#) [Create Case](#)

| <u>Set Name</u> | <u>Query</u> | <u>Hit Count</u> | <u>Set Name</u> |
|---|--------------|------------------|-----------------|
| side by side | | | result set |
| DB=PGPB,USPT,USOC,EPAB,JPAB,DWPI,TDBD; PLUR=YES; OP=ADJ | | | |

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|-----------|--------------------------|----|-----------|
| <u>L3</u> | L1 and 324/300-324.ccls. | 22 | <u>L3</u> |
| <u>L2</u> | L1 and saddle | 7 | <u>L2</u> |
| <u>L1</u> | 5394087 | 29 | <u>L1</u> |

END OF SEARCH HISTORY

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|-----------|--------------------------|----|-----------|
| <u>L3</u> | L1 and 324/300-324.ccls. | 22 | <u>L3</u> |
| <u>L2</u> | L1 and saddle | 7 | <u>L2</u> |
| <u>L1</u> | 5394087 | 29 | <u>L1</u> |

END OF SEARCH HISTORY

Refine Search

Search Results -

| Term | Documents |
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| 324/300 | 628 |
| 324/300S | 0 |
| 324/301 | 309 |
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| 324/302 | 47 |
| 324/302S | 0 |
| 324/303 | 608 |
| 324/303S | 0 |
| 324/304 | 183 |
| 324/304S | 0 |
| 324/305 | 27 |
| (L1 AND 324/300- 324.CCLS.).PGPB,USPT,USOC,EPAB,JPAB,DWPI,TDBD. | 22 |

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| Search: <input type="text" value=""/> | <input type="button" value="Refine Search"/> | |
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| <u>L3</u> | L1 and 324/300-324.ccls. | 22 | <u>L3</u> |
| <u>L2</u> | L1 and saddle | 7 | <u>L2</u> |
| <u>L1</u> | 5394087 | 29 | <u>L1</u> |

END OF SEARCH HISTORY

Hit List

Search Results - Record(s) 1 through 7 of 7 returned.

1. Document ID: US 6377836 B1 Relevance Rank: 59

Using default format because multiple data bases are involved.

L2: Entry 3 of 7

File: USPT

Apr 23, 2002

US-PAT-NO: 6377836

DOCUMENT-IDENTIFIER: US 6377836 B1

TITLE: RF coil array for vertical field MRI

DATE-ISSUED: April 23, 2002

INVENTOR-INFORMATION:

| NAME | CITY | STATE | ZIP CODE | COUNTRY |
|--------------------|---------------|-------|----------|---------|
| Arakawa; Mitsuaki | Hillsborough | CA | | |
| Carlson; Joseph W. | Kensington | CA | | |
| Kaufman; Leon | San Francisco | CA | | |
| Reveaux; James V. | San Francisco | CA | | |

US-CL-CURRENT: 600/422; 324/318, 324/322

2. Document ID: US 5610520 A Relevance Rank: 53

L2: Entry 7 of 7

File: USPT

Mar 11, 1997

US-PAT-NO: 5610520

DOCUMENT-IDENTIFIER: US 5610520 A

TITLE: Automatic orthogonality adjustment device for a quadrature surface coil for magnetic resonance imaging or spectroscopy

DATE-ISSUED: March 11, 1997

INVENTOR-INFORMATION:

| NAME | CITY | STATE | ZIP CODE | COUNTRY |
|------------------|---------|-------|----------|---------|
| Misic; George J. | Novelty | OH | | |

ASSIGNEE-INFORMATION:

| NAME | CITY | STATE | ZIP CODE | COUNTRY | TYPE CODE |
|-------------|------------|-------|----------|---------|-----------|
| Medrad Inc. | Pittsburgh | PA | | | 02 |

APPL-NO: 08/201862 [PALM]
DATE FILED: February 24, 1994

INT-CL-ISSUED: [06] G01 V 3/00, G01 V 3/14

US-CL-ISSUED: 324/318; 324/322

US-CL-CURRENT: 324/318; 324/322

FIELD-OF-CLASSIFICATION-SEARCH: 324/318, 324/319, 324/322, 324/300, 324/314, 364/413.13

See application file for complete search history.

PRIOR-ART-DISCLOSED:

U.S. PATENT DOCUMENTS

| PAT-NO | ISSUE-DATE | PATENTEE-NAME | US-CL |
|----------------|---------------|-------------------|-----------|
| <u>4467282</u> | August 1984 | Siebold | |
| <u>4712069</u> | December 1987 | Kemner et al. | |
| <u>4721913</u> | January 1988 | Hyde et al. | |
| <u>4763074</u> | August 1988 | Fox | 324/318 X |
| <u>4816765</u> | March 1989 | Boskamp | |
| <u>4820985</u> | April 1989 | Eash | 324/318 |
| <u>4918388</u> | April 1990 | Mehdizadeh et al. | |
| <u>5041790</u> | August 1991 | Tropp | 324/318 |
| <u>5202634</u> | April 1993 | Potthast | 324/322 |
| <u>5221901</u> | June 1993 | Derke | 324/318 |
| <u>5394087</u> | February 1995 | Molyneaux | 324/318 |
| <u>7752736</u> | June 1988 | Arakawa et al. | |

ART-UNIT: 225

PRIMARY-EXAMINER: O'Shea; Sandra L.

ASSISTANT-EXAMINER: Haynes; Mack

ATTY-AGENT-FIRM: Keck, Mahin & Cate

ABSTRACT:

An MRI/MRS magnetic coil system is disclosed wherein the isolation between the coils can be adjusted to decrease or virtually eliminate the coupling between quadrature magnetic resonance imaging coils in order to optimize orthogonality between the coils. The adjustment allows the use of flexible coils which may be conformed to image specific anatomical regions. The RF characteristics of the coils are controlled by variable capacitors. The capacitors are controlled by a remote automatic controller which functions to adjust the RF characteristics of the coils until an optimal orthogonality and signal to noise ratio is achieved between and by

the coils.

28 Claims, 8 Drawing figures

[Full](#) | [Title](#) | [Citation](#) | [Front](#) | [Review](#) | [Classification](#) | [Date](#) | [Reference](#) | [Claims](#) | [DOC](#) | [Draw](#)

3. Document ID: US 6714013 B2 Relevance Rank: 53

L2: Entry 2 of 7

File: USPT

Mar 30, 2004

US-PAT-NO: 6714013

DOCUMENT-IDENTIFIER: US 6714013 B2

** See image for Certificate of Correction **

TITLE: Magnetic resonance imaging receiver/transmitter coils

DATE-ISSUED: March 30, 2004

INVENTOR-INFORMATION:

| NAME | CITY | STATE | ZIP CODE | COUNTRY |
|------------------|--------------|-------|----------|---------|
| Misic; George J. | Allison Park | PA | | |

ASSIGNEE-INFORMATION:

| NAME | CITY | STATE | ZIP CODE | COUNTRY | TYPE CODE |
|--------------|-----------|-------|----------|---------|-----------|
| Medrad, Inc. | Indianola | PA | | | 02 |

APPL-NO: 10/151491 [PALM]

DATE FILED: May 20, 2002

PARENT-CASE:

CROSS-REFERENCE TO RELATED APPLICATIONS This application for patent is a continuation of U.S. application Ser. No. 09/776,132, filed Feb. 2, 2001, now issued as U.S. Pat. No. 6,396,273 on May 28, 2002. The '132 application is a continuation of U.S. application Ser. No. 09/512,093, filed Feb. 24, 2000, now abandoned, which is a divisional of U.S. application Ser. No. 08/979,842, filed Nov. 26, 1997, now issued as U.S. Pat. No. 6,040,697 on Mar. 21, 2000. The contents of the aforementioned documents are incorporated herein by reference.

INT-CL-ISSUED: [07] G01 N 3/00

US-CL-ISSUED: 324/318; 324/322

US-CL-CURRENT: 324/318; 324/322

FIELD-OF-CLASSIFICATION-SEARCH: 324/318, 324/322, 324/300, 324/306, 324/307, 324/309, 324/312, 324/314

See application file for complete search history.

PRIOR-ART-DISCLOSED:

U.S. PATENT DOCUMENTS

| PAT-NO | ISSUE-DATE | PATENTEE-NAME | US-CL |
|----------------|----------------|--------------------|---------|
| <u>4411270</u> | October 1983 | Damadian | |
| <u>4467282</u> | August 1984 | Siebold | |
| <u>4680548</u> | July 1987 | Edelstein et al. | |
| <u>4692705</u> | September 1987 | Hayes | |
| <u>4707664</u> | November 1987 | Fehn et al. | |
| <u>4793356</u> | December 1988 | Misic et al. | |
| <u>4825162</u> | April 1989 | Roemer et al. | |
| <u>4833429</u> | May 1989 | Keren et al. | 333/156 |
| <u>4923459</u> | May 1990 | Nambu | |
| <u>5179332</u> | January 1993 | Kang | |
| <u>5258717</u> | November 1993 | Misic et al. | |
| <u>5374890</u> | December 1994 | Zou et al. | |
| <u>5394087</u> | February 1995 | Molyneaux | |
| <u>5483158</u> | January 1996 | van Heteren et al. | |
| <u>5543711</u> | August 1996 | Srinivasan et al. | |
| <u>5551430</u> | September 1996 | Blakeley et al. | |
| <u>5559434</u> | September 1996 | Takahashi et al. | |
| <u>5565779</u> | October 1996 | Arakawa et al. | |
| <u>5578925</u> | November 1996 | Molyneaux et al. | |
| <u>5602479</u> | February 1997 | Srinivasan et al. | |
| <u>5610521</u> | March 1997 | Zou et al. | |
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| <u>5696449</u> | December 1997 | Boskamp | |
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| <u>6040697</u> | March 2000 | Misic | |
| <u>6137291</u> | October 2000 | Szumowski et al. | |
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| <u>6323648</u> | November 2001 | Belt et al. | 324/322 |

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| 0 758 091 | February 1997 | EP | |
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Adriany, G., et al., "A Transmit/Receive Quadrature Birdcage Array for 4 Tesla," Presentation to the International Society for Magnetic Resonance in Medicine, Fifth Scientific Meeting and Exhibition, Vancouver, B.C., Canada (Apr. 12-18, 1997).

Fitzsimmons, Jeffrey R., et al., "Radio Frequency Coil Development for High Field Whole Body MRI/MRS," High Field Workshop (Mar. 7, 1997).

Fitzsimmons, Jeffrey R., et al., "Very High Frequency Transceiver Phased Array RF Coil Development for Neuroimaging of the Human Cortex and Spinal Cord at 3 Tesla," NIH Grant Application (Feb. 1, 1997).

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Lian, J., et al., "Detachable RF Coil for Clinical Breast Imaging," Proceedings of the Society of Magnetic Resonance, vol. 1 (Aug. 19-25, 1995).

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Answer, Civil Action No. 02-2044 (Dec. 16, 2002).

MRI Devices Corporation's Response to Medrad's First Set of Interrogatories, Civil Action No. 02-2044 (Jan. 20, 2002).

Plaintiff Medrad's Responses to Defendant's First Set of Interrogatories, Civil Action No. 02-2044 (Jan. 20, 2003).

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Plaintiff Medrad's Responses to Defendant's Fifth Set of Interrogatories, Civil Action No. 02-2044 (Feb. 21, 2003).

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Expert Report of Dr. Peter B. Roemer Concerning Invalidity of Claims 1, 2, 3, 5, 16, and 23 of U.S. Patent 6,396,273, Civil Action 02-2044 (Mar. 14, 2003).

"Optimized Birdcage Resonators for Simultaneous MRI of Head and Neck," Proceedings of the Society of Magnetic Resonance, p. 1349 (1993).

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"Spatial Localization in 31P and 13C NMR Spectroscopy in vivo Using Surface Coils,"

Journal of Magnetic Resonance in Medicine, 1: 410-413 (1984).
"Comparison of Linear and Circular Polarization for Magnetic Resonance Imaging," Journal of Magnetic Resonance 64, 255-270 (1985).
Transcript of Testimony of Dr. Arne Reykowski at the Hearing ("Reykowski Transcript").
Deposition of Dr. Gregor Adriany ("Adriany Deposition").
Expert Report of Dr. Peter B. Roemer Concerning Noninfringement of Claims 1, 2, 3, 5, 16 and 23 of U.S. Patent No. 6,396,273 ("Roemer Noninfringement Report").
Expert Report of Kimberly A. Moore ("Moore Report").
MRI Devices' Motion for Summary Judgment of Noninfringement of the '273 Patent ("MRIDC's SJ Motion of Noninfringement").
MRI Devices' Memorandum Supporting Its Motion for Summary Judgment of Noninfringement of the '273 Patent ("MRIDC's Memo Supporting SJ Motion of Noninfringement").
MRI Devices' Motion for Summary Judgment to Invalidate Claims 1, 2, 3, 5, 16 and 23 of U.S. Patent No. 6,396,273 ("MRIDC's SJ Motion to Invalidate").
MRI Devices' Memorandum Supporting Its Motion for Summary Judgment to Invalidate Claims 1, 2, 3, 5, 16 and 23 of U.S. Patent No. 6,396,273 (MRIDC's Memo Supporting Invalidity Motion).
Appendix In Support of MRI Devices' Motion for Summary Judgment to Invalidate Claims 1, 2, 3, 5, 16 and 23 of U.S. Patent No. 6,396,273 ("MRIDC's Appendix to Invalidity Motion").
Medrad's Opposition to MRI Devices' Motion for Partial Summary Judgment to Invalidate Certain Claims of U.S. Patent No. 6,396,273 ("Medrad's Opposition to MRIDC's SJ Motion To Invalidate").
MRI Devices' Reply Supporting Its Motion for Summary Judgment to Invalidate All Asserted Claims of U.S. Patent No. 6,396,273 ("MRIDC's Reply").
Appendix In Support of MRI Devices' Reply Supporting Its Motion for Summary Judgment to Invalidate All Asserted Claims of U.S. Patent No. 6,396,273 ("MRIDC's Appendix to Reply").
Report and Recommendation of Magistrate Judge to Federal District Judge Terrence F. McVerry ("Magistrate's Report and Recommendation").
Plaintiff Medrad's Supplemental Responses to Defendant's First Set of Interrogatories (Mar. 26, 2003).
Expert Report of Dr. Cecil E. Hayes Pursuant to Rule 26(a)(2)(B) of the Federal Rules of Civil Procedure (Mar. 31, 2003).
Expert Report of Kenneth W. Belt Pursuant to Rule 26(a)(2)(B) of the Federal Rules of Civil Procedure (Mar. 31, 2003).
P. B. Roemer, et al., "The NMR Phased Array," Magnetic Resonance in Medicine, vol. 16, Copyright 1990, Academic Press, Inc., pp. 192-225.
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J. Jin, et al., "An Innovative Design of Combined Transmit/Receive RF Coil for MR Imaging," Department of Electrical and Computer Engineering, University of Illinois at Urbana-Champaign, Urbana, IL, Phillips Medical Systems North America, Shelton, CT, Aug. 1994, p. 1116, XP 002092172.
International Search Report for Counterpart PCT Application No. PCT/US98/23454.
"Knee Foot and Ankle Array," produced and sold by MRI Devices Corporation of Waukesha, WI, under Model No. KFA, Product Data Jul. 2000, CE0413.
Memorandum Order, Medrad, Inc. vs. MRI Devices Corporation, Civil Action No. 02-2044, Aug. 13, 2003.

ART-UNIT: 2862

PRIMARY-EXAMINER: Arana; Louis

ATTY-AGENT-FIRM: Bradley; Gregory L. Stevenson; James R.

ABSTRACT:

A magnetic resonance imaging receiver/transmitter coil system for providing images for regions of interest includes a first phased array formed of a plurality of electrically conductive members and defining an array volume and a second phased array formed of a second plurality of electrically conductive members and disposed at least partially within the defined array volume. At least one of the first and second phased arrays is adapted to apply a magnetic field to the defined array volume. At least one of the first and second phased arrays is further adapted to receive said applied magnetic field. The first phased array is extendible to define a further array volume and is provided with a switch for electrically coupling and decoupling an extension to effectively extend the length of the first phased array and thereby define the further array volume. In this manner the length of the first phased array is effectively extended to approximately twice its unextended length.

83 Claims, 7 Drawing figures

Full Title Citation Front Review Classification Date Reference Claims KOMC Drawn By

□ 4 Document ID: US 6806711 B2 Relevance Rank: 53

L2: Entry 1 of 7

File: USPT

Oct. 19, 2004

US-PAT-NO: 6806711

DOCUMENT-IDENTIFIER: US 6806711 B2

TITLE: High-frequency volume coil/surface coil arrangement for a magnetic resonance tomography apparatus

DATE-ISSUED: October 19, 2004

INVENTOR-INFORMATION:

| NAME | CITY | STATE | ZIP CODE | COUNTRY |
|-----------------|----------|-------|----------|---------|
| Reykowski; Arne | Erlangen | | | DE |

ASSIGNEE - INFORMATION:

| NAME | CITY | STATE | ZIP | CODE | COUNTRY | TYPE | CODE |
|----------------------------|--------|-------|-----|------|---------|------|------|
| Siemens Aktiengesellschaft | Munich | | | | DE | 03 | |

APPL-NO: 10/152895 [PALM]

DATE FILED: May 21, 2002

FOREIGN-APPL-PRIORITY-DATA:

COUNTRY APPL-NO APPL-DATE
DE 101 26 338 May 30, 2001

INT-CL-ISSUED: [07] G01 V 3/00

US-CL-ISSUED: 324/318

US-CL-CURRENT: 324/318

FIELD-OF-CLASSIFICATION-SEARCH: 324/300-309, 324/311, 324/314, 324/318-322, 600/410, 600/422, 333/219, 333/230
See application file for complete search history.

PRIOR-ART-DISCLOSED:

U.S. PATENT DOCUMENTS

| PAT-NO | ISSUE-DATE | PATENTEE-NAME | US-CL |
|---------------------|----------------|-------------------|---------|
| <u>4623844</u> | November 1986 | Macovski | 324/320 |
| <u>4680549</u> | July 1987 | Tanttu | |
| <u>4879516</u> | November 1989 | Mehdizadeh et al. | 324/318 |
| <u>4918388</u> | April 1990 | Mehdizadeh et al. | 324/322 |
| <u>5059906</u> | October 1991 | Yamanaka | 324/318 |
| <u>5198768</u> | March 1993 | Keren | 324/318 |
| <u>5394087</u> | February 1995 | Molyneaux | 324/318 |
| <u>5473251</u> | December 1995 | Mori | 324/318 |
| <u>5500596</u> | March 1996 | Grist et al. | 324/318 |
| <u>5617027</u> | April 1997 | Decke | |
| <u>5666055</u> | September 1997 | Jones et al. | 324/318 |
| <u>5682098</u> | October 1997 | Vij | 324/318 |
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| <u>6060882</u> | May 2000 | Doty | 324/318 |
| <u>6169401</u> | January 2001 | Fujita et al. | 324/318 |
| <u>6300761</u> | October 2001 | Hagen et al. | 324/318 |
| <u>6317091</u> | November 2001 | Oppelt | 343/742 |
| <u>6377044</u> | April 2002 | Burl et al. | 324/307 |
| <u>6504369</u> | January 2003 | Varjo et al. | 324/318 |
| <u>6624633</u> | September 2003 | Zou et al. | 324/318 |
| <u>2002/0196021</u> | December 2002 | Wang | 324/318 |
| <u>2003/0060699</u> | March 2003 | Creemers | 600/410 |

ART-UNIT: 2859

PRIMARY-EXAMINER: Fulton; Christopher W.

ASSISTANT-EXAMINER: Vargas; Dixomara

ATTY-AGENT-FIRM: Schiff Hardin LLP

ABSTRACT:

High-frequency coil arrangement for a magnetic resonance tomography apparatus and magnetic resonance tomography apparatus employing such an arrangement have a surface coil and a loop coil for enclosing the examination subject. Both coils are fashioned for receiving the same first polarization component. A switching device

is present for alternately deactivating and/or activating the surface coil and the loop coil. The two coils are preferably arranged on a common carrier structure that is bendable.

24 Claims, 7 Drawing figures

[Full](#) | [Title](#) | [Citation](#) | [Front](#) | [Review](#) | [Classification](#) | [Date](#) | [Reference](#) | [Claims](#) | [EPOAC](#) | [Drawings](#)

5. Document ID: US 6137291 A Relevance Rank: 53

L2: Entry 4 of 7

File: USPT

Oct 24, 2000

US-PAT-NO: 6137291

DOCUMENT-IDENTIFIER: US 6137291 A

TITLE: Telescoping coil array for magnetic resonance imaging of extremities

DATE-ISSUED: October 24, 2000

INVENTOR-INFORMATION:

| NAME | CITY | STATE | ZIP CODE | COUNTRY |
|------------------|----------|-------|----------|---------|
| Szumowski; Jerzy | Portland | OR | | |
| Kojima; Kryss | Portland | OR | | |

ASSIGNEE-INFORMATION:

| NAME | CITY | STATE | ZIP CODE | COUNTRY | TYPE CODE |
|-----------------------------------|----------|-------|----------|---------|-----------|
| Oregon Health Sciences University | Portland | OR | | | 02 |

APPL-NO: 08/914483 [PALM]

DATE FILED: August 19, 1997

PARENT-CASE:

RELATED APPLICATION This application claims priority from our now abandoned provisional application Ser. No. 601,024,138, filed Aug. 19, 1996.

INT-CL-ISSUED: [07] G01 V 3/00

US-CL-ISSUED: 324/318; 600/422

US-CL-CURRENT: 324/318; 600/422

FIELD-OF-CLASSIFICATION-SEARCH: 324/318, 324/319, 324/320, 324/322, 324/300, 324/307, 324/309, 600/422, 600/423

See application file for complete search history.

PRIOR-ART-DISCLOSED:

U.S. PATENT DOCUMENTS

PAT-NO

ISSUE-DATE

PATENTEE-NAME

US-CL

| | | | |
|----------------|----------------|------------------|---------|
| <u>4721913</u> | January 1988 | Hyde et al. | |
| <u>4825162</u> | April 1989 | Roemer et al. | |
| <u>4985678</u> | January 1991 | Gangarosa et al. | |
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| <u>5361764</u> | November 1994 | Reynolds et al. | 324/318 |
| <u>5394087</u> | February 1995 | Molyneaux | |
| <u>5399970</u> | March 1995 | Pelc et al. | |
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Kulkarni et al., Technical Considerations for the Use of Surface Coils in MRI, AJR 147:373-378, Aug. 1986.

Rajan et al., An Extended-Length Coil Design for Peripheral MR Angiography, Magnetic Resonance Imaging , vol. 9, pp. 493-495, 1991.

Ginsberg et al., Optimum Geometry of Saddle Shaped Coils for Generating a Uniform Magnetic Field, The Review of Scientific Instruments, vol. 14, No. 1, Jan. 1970., pp. 122-123.

ART-UNIT: 282

PRIMARY-EXAMINER: Arana; Louis

ATTY-AGENT-FIRM: Klarquist Sparkman Campbell Leigh & Whinston, LLP

ABSTRACT:

An MR coil array includes a plurality of telescopically arranged coil units, spanning the length of an extremity (e.g. a leg). The coil in each unit encircles the extremity, providing good SNR from all sides and for deep structures as well. The tapered shape of the array conforms generally to the patient anatomy, minimizing sensing distances, further enhancing SNR. A low ratio between the volume

imaged and the aggregate coil conductor length further contributes to high SNR. A multiplicity of tuning capacitors makes the array relatively insensitive to detuning by differently-sized patients. Adjoining coils can be oriented to produce perpendicular magnetic fields, reducing coupling therebetween. An apparatus employing two such coil arrays allows imaging of two extremities at once.

7 Claims, 10 Drawing figures

[Full](#) | [Title](#) | [Citation](#) | [Front](#) | [Review](#) | [Classification](#) | [Date](#) | [Reference](#) | [Claims](#) | [KMD](#) | [Drawings](#)

6. Document ID: US 5898306 A Relevance Rank: 53

L2: Entry 6 of 7

File: USPT

Apr 27, 1999

US-PAT-NO: 5898306

DOCUMENT-IDENTIFIER: US 5898306 A

** See image for Certificate of Correction **

TITLE: Single circuit ladder resonator quadrature surface RF coil

DATE-ISSUED: April 27, 1999

INVENTOR-INFORMATION:

| NAME | CITY | STATE | ZIP CODE | COUNTRY |
|--------------------|-------------|-------|----------|---------|
| Liu; Haiying | Minneapolis | MN | | |
| Truwit; Charles L. | Wayzata | MN | | |

ASSIGNEE-INFORMATION:

| NAME | CITY | STATE ZIP CODE | COUNTRY | TYPE CODE |
|--|-------------|----------------|---------|-----------|
| Regents of the University of Minnesota | Minneapolis | MN | | 02 |

APPL-NO: 08/838604 [PALM]

DATE FILED: April 9, 1997

INT-CL-ISSUED: [06] G01 V 3/00

US-CL-ISSUED: 324/322; 324/318

US-CL-CURRENT: 324/322; 324/318

FIELD-OF-CLASSIFICATION-SEARCH: 324/318, 324/322, 324/300, 324/314, 324/312, 324/307, 324/309

See application file for complete search history.

PRIOR-ART-DISCLOSED:

U.S. PATENT DOCUMENTS

| PAT-NO | ISSUE-DATE | PATENTEE-NAME | US-CL |
|----------------|---------------|---------------|---------|
| <u>4707664</u> | November 1987 | Fehn et al. | 324/322 |

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|----------------|----------------|----------------------|---------|
| <u>4721913</u> | January 1988 | Hyde et al. | 324/318 |
| <u>4752738</u> | June 1988 | Patrick et al. | 324/318 |
| <u>4816765</u> | March 1989 | Boskamp | 324/318 |
| <u>4839594</u> | June 1989 | Misic et al. | 324/318 |
| <u>4879516</u> | November 1989 | Mehdizadeh et al. | 324/318 |
| <u>4881032</u> | November 1989 | Bottomley et al. | 324/309 |
| <u>4906933</u> | March 1990 | Keren | 324/318 |
| <u>4918388</u> | April 1990 | Mehdizadeh et al. | 324/322 |
| <u>4931734</u> | June 1990 | Kemner et al. | 324/318 |
| <u>4985678</u> | January 1991 | Gangarosa et al. | 324/318 |
| <u>5030915</u> | July 1991 | Boskamp et al. | 324/318 |
| <u>5045792</u> | September 1991 | Mehdizadeh | 324/318 |
| <u>5144240</u> | September 1992 | Mehdizadeh et al. | 324/318 |
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| <u>5235277</u> | August 1993 | Wichern | 324/318 |
| <u>5280248</u> | January 1994 | Zou et al. | 324/318 |
| <u>5285160</u> | February 1994 | Loos et al. | 324/318 |
| <u>5365173</u> | November 1994 | Zou et al. | 324/322 |
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| <u>5394087</u> | February 1995 | Molyneaux | 324/318 |
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| <u>5521506</u> | May 1996 | Misic et al. | 324/322 |

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Ballon, D., et al., "A 64 MHz Half-Birdcage Resonator for Clinical Imaging", J. of Magnetic Resonance, 90, 131-140, (1990).

Hu, X., et al., "Reduction of Field of View for Dynamic Imaging", Magnetic Resonance in Medicine, 31, No. 6, 691-694, (1994).

Mehdizadeh, M., "RF Coils for Magnetic Resonance Imaging", RF Design, 29-38, (1991).

Panych, L.P., et al., "A Dynamically Adaptive Imaging Algorithm for Wavelet-Encoded MRI", Magnetic Resonance in Medicine, 32, No. 6, 738-746, (1994).

ART-UNIT: 287

PRIMARY-EXAMINER: Arana; Louis

ATTY-AGENT-FIRM: Schwegman, Lundberg, Woessner, and Kluth, P.A.

ABSTRACT:

A single-circuit quadrature surface coil is formed from two ladder resonator coils and includes a first mode circuit path for detecting or generating magnetic flux in a vertical axis from a body under investigation and a second mode circuit path for detecting or generating magnetic flux in a parallel axis, with the first mode and second mode currents 90 degrees out of phase. The surface coil, which supports two resonance current modes for quadrature operation on only one single coil conductor structure, provides a high signal-to-noise ratio (SNR) and a good B.sub.1

homogeneity over the imaging volume. This coil alone may be used either for both transmitting and receiving RF signals or for detecting RF signals as "receive only." This coil is well suited for imaging the human neck, spine and heart.

17 Claims, 7 Drawing figures

Full Title Citation Front Review Classification Date Reference Claims EPOIC Drawn

7. Document ID: US 5951474 A Relevance Rank: 53

L2: Entry 5 of 7

File: USPT

Sep 14, 1999

US-PAT-NO: 5951474

DOCUMENT-IDENTIFIER: US 5951474 A

TITLE: Magnetic resonance imaging apparatus for detecting magnetic resonance signals by radio frequency receiving coils

DATE-ISSUED: September 14, 1999

INVENTOR-INFORMATION:

| NAME | CITY | STATE | ZIP CODE | COUNTRY |
|----------------------|----------|-------|----------|---------|
| Matsunaga; Yoshikuni | Hachioji | | | JP |
| Takahashi; Tetsuhiko | Soka | | | JP |

ASSIGNEE - INFORMATION:

| NAME | CITY | STATE | ZIP CODE | COUNTRY | TYPE | CODE |
|-----------------------------|-------|-------|----------|---------|------|------|
| Hitachi Medical Corporation | Tokyo | | | JP | 03 | |

APPL-NO: 08/804925 [PALM]
DATE FILED: February 24, 1997

FOREIGN-APPL-PRIORITY-DATA:

| COUNTRY | APPL-NO | APPL-DATE |
|---------|----------|----------------|
| JP | 8-129316 | April 26, 1996 |

INT-CL-ISSUED: [06] A61 B 5/055

US-CL-ISSUED: 600/422; 324/318, 324/322

US-CL-CURRENT: 600/422; 324/318, 324/322

FIELD-OF-CLASSIFICATION-SEARCH: 128/653.2, 128/653.5, 324/318, 324/322, 600/410, 600/422

See application file for complete search history.

PRIOR-ART-DISCLOSED:

U. S. PATENT DOCUMENTS

| PAT-NO | ISSUE-DATE | PATENTEE-NAME | US-CL |
|----------------|---------------|--------------------|-----------|
| <u>4733190</u> | March 1988 | Dembrinski | 324/318 |
| <u>4739269</u> | April 1988 | Kopp | 324/318 |
| <u>4918388</u> | April 1990 | Mehdizadeh | 324/322 |
| <u>4920318</u> | April 1990 | Misic et al. | 324/318 |
| <u>5198768</u> | March 1993 | Keren | 324/318 |
| <u>5270656</u> | December 1993 | Roberts et al. | 324/318 |
| <u>5277183</u> | January 1994 | Vij | 128/653.5 |
| <u>5296813</u> | March 1994 | Holmes et al. | 324/322 |
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| <u>5394087</u> | February 1995 | Molyneaux | 324/318 |
| <u>5465719</u> | November 1995 | Itagaki et al. | 128/653.5 |
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| <u>5502387</u> | March 1996 | McGill | 324/318 |
| <u>5581185</u> | December 1996 | Petropoulos et al. | 324/318 |
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| FOREIGN-PAT-NO | PUBN-DATE | COUNTRY | CLASS |
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| 0565178 A1 | January 1993 | EP | |

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"A Highly Sensitive Multiple RF Coil For Magnetic Resonance Imaging", T. Takahashi et al, Research & Development Center, Hitachi Medical Corporation, pp. 215-217.

ART-UNIT: 377

PRIMARY-EXAMINER: Jaworski; Francis J.

ASSISTANT-EXAMINER: Mercader; Eleni Mantis

ATTY-AGENT-FIRM: Antonelli, Terry, Stout & Kraus, LLP

ABSTRACT:

RF receiving coil device used in a magnetic resonance imaging apparatus capable of acquiring a tomographic image of an object under examination positioned in a static magnetic field along a predetermined direction including quadrature detection coils for detecting an MR signal component along a direction perpendicular to a body axis direction of the object under examination and also perpendicular to a direction of the static magnetic field, and for detecting another MR-signal component along the body axis direction.

24 Claims, 13 Drawing figures

[Full](#) | [Title](#) | [Citation](#) | [Front](#) | [Review](#) | [Classification](#) | [Date](#) | [Reference](#) | [Claims](#) | [BNC](#) | [Group](#)

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| Term | Documents |
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| SADDLE | 70319 |
| SADDLES | 14191 |
| (1 AND SADDLE) . PGPB, USPT, USOC, EPAB, JPAB, DWPI, TDBD. | 7 |
| (L1 AND SADDLE) . PGPB, USPT, USOC, EPAB, JPAB, DWPI, TDBD. | 7 |

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| 324/302 | 47 |
| 324/302S | 0 |
| 324/303 | 608 |
| 324/303S | 0 |
| 324/304 | 183 |
| 324/304S | 0 |
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